

MOBILITY MOTIVES AND PRACTICES TO ACCESS SERVICES IN LATIN AMERICAN CONTEXTS: A REINFORCEMENT OF CENTRALIZATION IN THE CITIES OF SOUTHERN CHILE ¹

MOTIVOS Y PRÁCTICAS DE DESPLAZAMIENTO PARA EL ACCESO A SERVICIOS EN CONTEXTOS LATINOAMERICANOS: UN REFUERZO DE LA CENTRALIZACIÓN EN LAS CIUDADES DEL SUR DE CHILE

FRANCISCO RAMÓN MATURANA-MIRANDA ²
FERNANDO ANDRÉS PEÑA-CORTÉS ³
SERGIO SOZA-AMIGO ⁴
JORGE EDUARDO CÁRDENAS-PIZARRO ⁵

- 1 Fondo Nacional de Desarrollo Científico y Tecnológico FONDECYT Regular N°1230159 "Modelación prospectiva de los servicios básicos en asentamientos humanos del Sur de Chile. Propuestas para su gestión territorial" y FONDECYT Regular N°1221931 "Repensando el Ordenamiento Territorial en Chile: Conocimiento local y mapuche y escenarios co-construidos para la toma de decisiones sostenibles".
- 2 Doctorado en Planificación Regional, Urbanismo y Dinámica Espacial
Profesor Asociado, Instituto de Ciencias de la Tierra
Universidad Austral de Chile, Valdivia, Chile
<https://orcid.org/0000-0003-3963-5807>
francisco.maturana@uach.cl
- 3 Doctorado en Ciencias Ambientales
Profesor titular, Laboratorio de Planificación Territorial,
Departamento de Ciencias Ambientales, Facultad de Recursos Naturales
Universidad Católica de Temuco, Temuco, Chile
<https://orcid.org/0000-0002-0489-1555>
fpena@uct.cl
- 4 Doctorado en Economía Aplicada
Profesor titular, Instituto de Gestión e Industria
Universidad Austral de Chile, Valdivia, Chile
<https://orcid.org/0000-0002-8256-6782>
sergio.soza@uach.cl
- 5 Geógrafo
Profesional de Apoyo, Laboratorio de Transiciones Territoriales de la Zona Sur y Austral
Universidad Austral de Chile, Valdivia, Chile
<https://orcid.org/0000-0003-2815-9489>
jorge.cardenas_pizarro@stud.uni-heidelberg.de

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La concentración de la población en capitales regionales y el papel de éstas en la división político-administrativa generan asimetrías en el equipamiento urbano y en la oferta de servicios. En este contexto, los habitantes de ciudades de menor tamaño se ven obligados a desplazarse hacia centros urbanos mayores para satisfacer diversas necesidades, lo que produce efectos diferenciados en los territorios de origen y destino. Este estudio analiza, a partir de una encuesta aplicada a 766 personas residentes en ciudades pequeñas y medianas, los motivos, niveles de confort, gasto y tiempos de desplazamiento asociados a la búsqueda de servicios hacia Temuco y Valdivia, dos capitales regionales del sur de Chile que han experimentado procesos de metropolización. Los resultados indican que al menos el 60% de los desplazamientos supera una hora de duración y que el transporte público es el medio más utilizado, evidenciándose, además, una heterogeneidad en los motivos de viaje. Estos hallazgos permiten visibilizar los procesos de movilidad en el marco de ciudades en transición hacia la metropolización como un componente clave en las orientaciones de la Política Nacional de Ordenamiento Territorial, particularmente en relación con la accesibilidad y su operacionalización a través del Sistema de Indicadores y Estándares Territoriales (SIET-Chile)

Palabras clave: accesibilidad, servicios básicos, transporte, jerarquía urbana, desplazamientos

The concentration of the population in regional capitals, along with their role in the political-administrative division, generate asymmetries in urban infrastructure and service provision. In this context, residents of smaller cities are often compelled to travel to larger urban centers to meet various needs, producing differentiated effects in both origin and destination areas. This study analyzes, based on a survey of 766 residents of small- and medium-sized cities, the motivations, comfort levels, expenses, and travel times associated with accessing services in Temuco and Valdivia, two regional capitals in southern Chile that have undergone processes of metropolitanization. The results indicate that at least 60% of trips take over an hour, that public transportation is the most commonly used mode, and that travel purposes show significant heterogeneity. These findings highlight mobility processes in cities undergoing metropolitanization as a key component in guiding the National Regional Planning Policy, particularly for accessibility and its operationalization through the System of Territorial Indicators and Standards (SIET-Chile).

Keywords: accessibility, basic services, transportation, urban hierarchy, trips

I. INTRODUCTION

Territories have been profoundly transformed by neoliberalism and globalization, reconfiguring socio-spatial dynamics and generating new urban centralities, as well as an increase in different flows (De Mattos, 2010; Zurbano, Bidaurrezaga & Martinez, 2014; Beuf, 2020; Soza-Amigo, Parada & Cholera, 2023). This integration has intensified the movement of people, goods, ideas, and capital, affecting cities locally and globally and causing changes at both macro- and micro-urban levels (Sheller & Urry, 2016; Kara, 2019). As a result, cities have experienced heterogeneous growth, giving rise to differently sized but unequally geographically distributed cities with similar needs (Liu et al., 2021). This process has occurred within a context of asymmetries and increasing demands for basic services such as energy, water, health, and transport, which are stressing urban infrastructure and can aggravate existing inequalities (Guo & Ma, 2023; He et al., 2022).

Thus, differences in population distribution involve asymmetries in the provision and development of services. It is in this context that challenges emerge in the medium-sized cities of South America, due to their intermediate position between urban poles and rural areas, and within the urban systems in which they are embedded (Maturana Miranda & Montoya, 2021; Chávez et al., 2008). In that way, the cities within urban systems express an important part of diffuse, fragmented and segregated peri-urban expansion (Ubilla-Bravo & Mardones Cáceres, 2024), but one unaccompanied by a relevant battery of services that promotes greater mobility and limits the benefits from the specialization or diversification of cities' economic roles (Maturana Miranda, Peña-Cortés & Ortiz Nova, 2024).

As a result, this leads to a lack of basic services that is strongly intertwined with territorial inequality and expressed at the housing level through a lack of access to water, sanitation, and electricity. In this regard, the Economic Commission for Latin America and the Caribbean [ECLAC] (2022) has emphasized that, in Latin America, vulnerability tends to be greater in rural areas due to weaknesses in infrastructure, not only in water and sanitation, but also in other basic services, deficiencies that are linked to social exclusion and limitations for development.

In Chile, urban development has been a dynamic process similar to that observed in other medium-sized cities in South America (Maturana et al., 2017). However, this evolution has not significantly improved access to basic services; rather, it has generated high levels of dependence and displacement from smaller areas

to larger urban centers (Maturana et al., 2017). It is in this sense that accessibility has become a core issue for evaluating urban sustainability (Rojas, Vecchio & Ladrón de Guevara, 2024), in line with the Sustainable Development Goals [SDGs] that establish the provision of basic services by 2030 as a fundamental aspect for national development (Ministry of Social Development and Family of Chile, 2025).

The National Urban Development Policy of Chile, passed in 2014 and currently being updated, established the definition of Urban Public Goods [BPU, in Spanish] and created the Urban Development Standards Indicator System [SIEDU, in Spanish] to measure and monitor progress towards more sustainable and equitable cities, aligned with the Sustainable Development Goals (Ministry of Housing and Urbanism, 2014; Hidalgo Dattwyler et al., 2021). At the same time, and within the framework of the National Rural Development Policy, the System of Indicators of Rural Quality of Life [SICVIR, in Spanish] was created to assess gaps and inequalities in access to basic services in non-urban areas. Both were later systematized in the new System of Territorial Indicators [SIET, in Spanish], which seeks to provide relevant information for both urban and rural policy, within the framework of the National Territorial Planning Policy [PNOT, in Spanish].

However, despite these policies and monitoring mechanisms being in place, gaps in the available details hinder understanding of the challenges of accessing essential services such as drinking water, sanitation, education, and health. Significant challenges also persist in their equitable provision, especially for vulnerable groups, which include a growing housing deficit (United Nations Peru, 2021; Centro de Estudios Techo Chile, 2024). In fact, in the educational field, although the State has led various initiatives to improve the quality and equity of the system, inequalities persist, particularly in rural areas and smaller cities (Basulto Gallegos, Castro Cáceres & Jara Jara, 2023; González, 2017), all of which warrant understanding. In health, although the universal coverage system reaches a significant share of the population, gaps in equitable access persist (especially in rural areas and among vulnerable groups), and significant differences remain between public and private care (Ministry of Health of Chile, 2022).

Therefore, despite efforts to understand accessibility levels, many scales of analysis do not consider smaller urban spaces or cities undergoing metropolization (Rojas, Vecchio & Ladrón de Guevara, 2024). In this context, the cities of Temuco and Valdivia, the regional capitals of the La Araucanía and Los Ríos Regions, located 600

and 800 km south of the capital, Santiago, respectively, are relevant cases to analyze due to their population concentration and their locations within their respective areas of influence. The first (Temuco), with around 373,174 inhabitants, accounts for approximately 37% of the region's population, while Valdivia, with 170,043, accounts for 42% (National Institute of Statistics of Chile [INE], 2024). In addition, this population concentration, beyond its magnitude, is not related to its spatial location, as shown in Figure 1: Temuco is central, located next to the dual-carriageway southern route 5. Meanwhile, Valdivia is coastal and has limited access via single-lane roads.

Despite the relevance of these regional capitals, the characteristics of journeys within their spheres of influence, the reasons behind them, and the resulting spatial model remain insufficiently documented. This article aims to analyze the reasons and some effects of the inhabitants' movements in these regions, where dependency relationships and practices associated with access to basic services in urban-rural contexts are made clear. The question is posed: how are these journeys, their reasons, times, and comfort structured, and what effects do these movements have on the population living in smaller cities in search of basic services? This question falls within the analysis of interurban displacement dynamics linked to the centralization of urban services, a phenomenon that directly affects the functional relationships between cities of different sizes. It is also related to the validity and materialization of the principles established in the National Territorial Planning Policy, particularly their connection between urban and rural areas, with a focus on smaller cities in southern Chile.

II. THEORETICAL FRAMEWORK

Accessibility and its components

Accessibility has become a fundamental process that triggers displacement dynamics or pendulum movements in Latin America. These dynamics are explained by the asymmetries in the distribution of the population within urban centers, which promote interurban journeys and even the expansion of these centers, particularly in metropolitan areas, where movements are generated within their areas of influence (Riquelme, Saravia & Azócar, 2019; Lobo & Cunha, 2019; Tiznado-Aitken et al., 2023).

Accessibility has been classically defined as how easily one or more individuals can move from their origin to a destination. However, this conception, focused on measuring distances and travel times, tends to reduce

the phenomenon to a purely functional dimension of displacement. From a broader perspective, accessibility refers to the spatio-temporal constraints that structure everyday life and shape the real possibilities for social interaction. In this sense, it depends not only on the distance to the demand and its size (Harris, 1954), but also on historically produced territorial configurations that unevenly distribute opportunities and services.

In an attempt to overcome strictly metric approaches, Geurs and Van Wee (2004) propose a multidimensional conceptualization based on four interrelated components: land use, the transport system, the temporal dimension, and the individual component. However, from a critical perspective, these components do not operate neutrally but reflect power relations, socio-economic inequalities, and differentiated capacities for appropriating and using practices, as they are reflected in space. The location of activities (land use) responds to market and planning logics that privilege certain areas; transport infrastructure materializes political decisions and budgetary priorities; temporality expresses labor and organizational systems that do not affect everyone equally; and the individual component is linked to unequally distributed economic, social, and cultural capitals (Soza-Amigo et al., 2023).

The urban hierarchy: A key element in population distribution

Accessibility and journeys within the area are closely linked to inequalities in the population's spatial distribution, where notions of urban hierarchy and asymmetric centralities become relevant. The hierarchy refers to the differential population magnitudes within territories and, far from being an anomaly, represents a structural regularity of urban systems: certain cities tend to concentrate a significantly higher proportion of the population than others and to reproduce this inequality over time (Pumain & Saint-Julien, 2014). The same applies to countries in Latin American contexts (Maturana Miranda & Montoya, 2021).

In this framework, urban systems have a pyramidal organization: there is a broad base of numerous low-population urban centers, while towards the top, the number of cities decreases sharply, although these concentrate a substantial proportion of the total population. This configuration not only describes a demographic structure but also expresses a logic of concentration of functions, resources, and opportunities associated with the laws of scale and development possibilities (Bettencourt et al., 2007; Pumain et al., 2006). Consequently, population size becomes a determining factor in the material and immaterial viability of certain services, particularly in domestic contexts where the

State's redistributive and planning capacity is limited, leading to unequal socio-economic benefits for cities according to size and growth (Arvidsson, Lovsjö & Keuschnigg, 2023).

Medium-sized or intermediate cities

The size of cities, measured by population, becomes relevant and prompts reflection on the distinction between medium-sized and intermediate cities. The first is associated with a statistical notion, while the second places greater emphasis on dynamic aspects, such as strategy, urban positioning, mediation, and synergies. According to Bellet Sanfeliu and Llop Torné (2004), a city's potential would not depend on its population size; rather, its importance would lie in its ability to generate relationships and integrate into the urban network.

This definition of intermediate cities is linked to European contexts, where this concept emerged and where the possibilities for well-being offered by States, associated with much denser occupations (consider the approximately 36,000 French communes), give these cities greater relevance and capacities for interaction and insertion. However, in Latin America, this notion is not fully applicable and has been used exclusively in analyses and case studies of non-metropolitan spaces, without explicitly questioning the notions of size and intermediation (Maturana et al., 2017).

Thus, the definition of medium-sized or intermediate cities is limited to the urban system in which they are immersed. Regardless of the territorial system in which they are situated, which implies their classification, these cities play a fundamental role in the organization of urban systems, albeit with differentiated roles. In fact, this city could be an average-sized city in a rural, more peripheral environment, close to a metropolitan area or an intermediate one between the metropolitan and the rural, providing different supply roles (Dehne et al., 2023; Mary-Portas & Bertrand, 2017).

Medium-sized cities close to metropolitan areas tend to have high levels of dependency (possibly mutual in some cases) and to favor intense pendular and economic flows. This means that their development begins to be subordinated (and vice versa) through the configuration of highly connected polycentric metropolitan spaces (Santamaria, 2012). For example, the availability of land for new housing is frequently materialized in these medium-sized cities. However, it is not always accompanied by a complete set of associated services, particularly when the metropolitan area is not highly consolidated, as is the case in Santiago de Chile (Ubilla-Bravo & Chia, 2021).

III. METHODOLOGY

In this study, a quantitative design was adopted using cluster sampling, which involves selecting a sample from defined spatial units and their subsets, making it more efficient and much less expensive (Otzen & Manterola, 2017; Ríos Calderón, 2022). Two criteria were used to define the cities' sample units: first, the proximity to the regional capitals, Temuco (La Araucanía) and Valdivia (Los Ríos), established by a buffer of 60 km in QGIS based on road map data of 2017 from the Ministry of Public Works of Chile; secondly, the role of provincial capital and the location in communes further from the regional capital. Regarding the first criterion, the choice of this distance is based on the available time for a daily commute, which is around an hour or an hour and a half at most (Guérois et al., 2016; Pumain, Bretagnolle & Degorge-Lavagne, 1999).

23 urban entities were selected, 12 in the Araucanía Region (37.5%) and 11 in the Los Ríos Region (91.6%) (see Figure 1). For these cities, an intercept survey was conducted during the morning in high-mobility public places, such as Plazas de Armas (main town squares) and public transport stops, between October and November 2023 (Antolín et al., 2015; Sperry et al., 2012). The questionnaire, based on the INE instrument (2018), included questions about equipment and access at home, reasons and places of expenditure, frequency and means of travel, among other aspects (see Appendix 1). The sample was determined using simple random sampling, considering inhabitants older than 20 years old according to INE's 2017 census (2017), with populations of 150,176 and 157,256 for La Araucanía and Los Ríos, respectively, and a confidence level of 95% with a margin of error of 5%, following the method described by Hernández-Sampieri and Mendoza (2018). The equation to determine the sample is presented below (Equation 1):

$$n = (Z^2 \cdot p \cdot (1-p)) / e^2 \quad (\text{Equation 1})$$

Where:

n = the sample size.

Z = confidence level.

e = desired margin of error.

p = the proportion that one wishes to measure.

When applying this formula, it was estimated that 383 surveys per region were needed for people aged over 20. Subsequently, a second formula was applied to obtain a population factor and thus estimate the number of surveys per city (Equation 2):

$$n' = n \cdot P_{\text{obT}} \quad (\text{Equation 2})$$

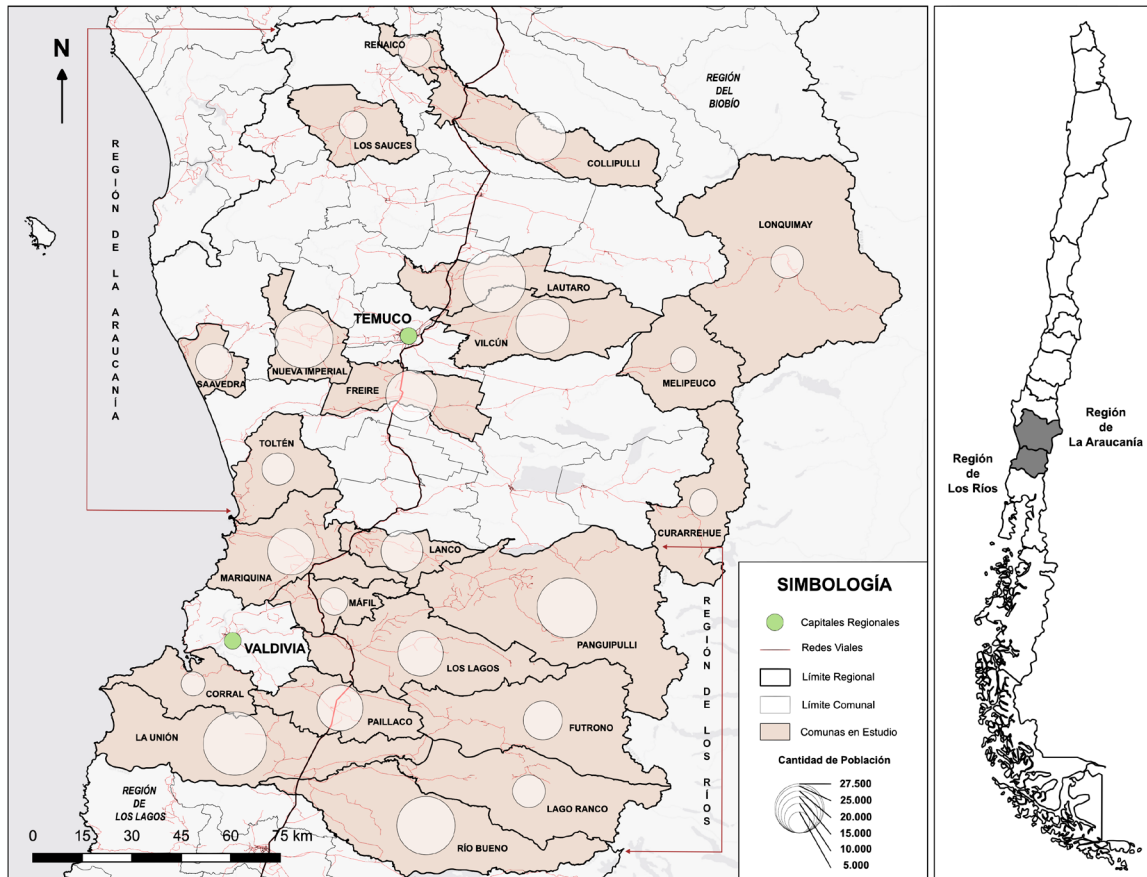


Figure 1. Study area in the La Araucanía and Los Ríos regions. Source: Prepared by the authors.

Where:

n' = population factor.

n = the sample size.

PobT = total population.

When obtaining the factor, reflected in Equation 2, Equation 3 is applied to obtain the number of surveys to be carried out per spatial unit (estimation of the population factor):

$$n'' = (\text{PobC}_i) * n' \quad (\text{Equation 3})$$

Where:

n'' = number of surveys.

PobC_i = population of each city.

n' = factor.

For this research, 766 surveys were administered across the cities and towns of each region, as shown in Figure 1. For the analysis, simple frequencies and contingency tables

were calculated, and a Multiple Correspondence Analysis [MCA] was applied. The R programming language and the FactoMineR library were used (Husson et al., 2023). It was considered to apply an ACM, since it is a multivariate statistical technique that allows exploration and visualization of the relationships among categorical variables by representing them on a factorial plane. This method allows identifying association patterns between categories, as well as the "proximity" or "distancing" between the individuals surveyed based on their answers, categorizing them according to their similarities. In this way, the ACM allows summarizing large sets of qualitative information by projecting both variables (questions asked to people) and individuals (people) into the same factor space, which facilitates the interpretation of underlying structures in the data and detecting behavioral profiles or groupings. According to Husson, Lê and Pagès (2017), this technique is especially useful in social and regional studies where categorical variables from surveys or questionnaires predominate, since it

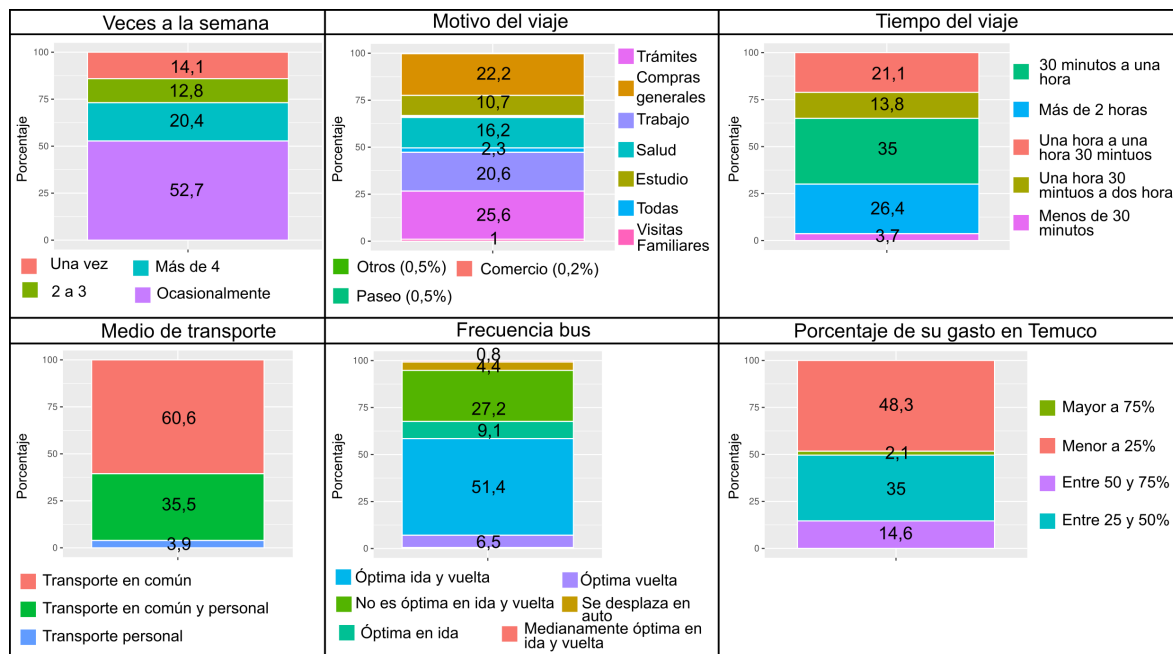


Figure 2. General results of the survey applied in cities around Temuco. Source: Prepared by the authors.

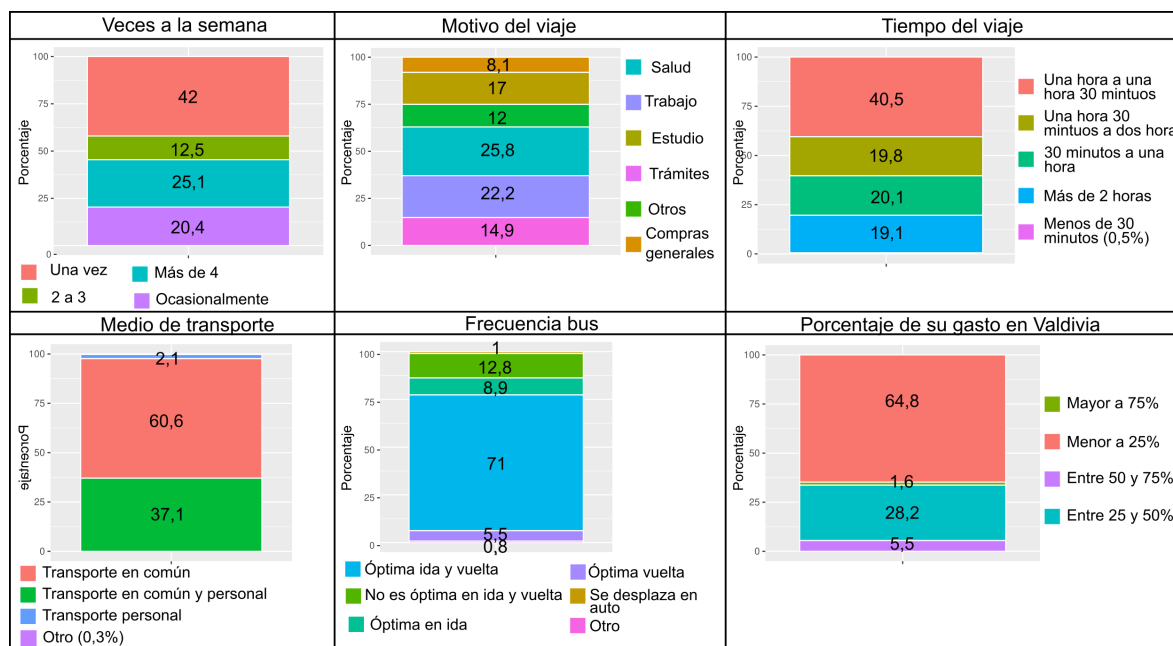


Figure 3. General results of the survey applied in cities around Valdivia. Source: Prepared by the authors.

allows multiple dimensions of the data to be analyzed simultaneously and to understand the relationships between them in an exploratory and visual way. In this sense, it has been applied for survey research in Latin American contexts such as Lamfre, Perren, and Bramardi (2023) for Argentina regarding quality of life; in addition to being applied in other areas in surveys associated with health or consumption (Bécue-Bertaut & Pagès, 2008; Bejaei, Cliff, & Singh, 2020; Muda & Ahmad Raphaie, 2025). The resulting ACM graphics were later redesigned with the open-source vector graphics editor Inkscape.

IV. RESULTS

Figures 2 and 3 summarize the journey frequencies in Temuco (La Araucanía Region) and Valdivia (Los Ríos Region). In Temuco, 52% of trips are occasional, while the remaining 48% travel at least once a week, with 20.4% doing so four or more times a week. The main reasons are for services and work, with errands (25%), health (16.2%), work (20.6%), and general purchases (22%) standing out. Travel times usually exceed 30 minutes, with more than 60% of trips lasting over an hour and 26% over two hours. Transport alternates between bus and personal vehicle, with the bus being the most used; half of the respondents consider the frequency optimal, although 27% rate the quality as low. Finally, at least half allocate more than 25% of their income (excluding housing) to these trips, reflecting the intensity and cost of travel.

In the Los Ríos Region, Valdivia is a coastal city and less central than Temuco. This does not significantly alter the journey logic, since 42% of people travel weekly to Valdivia and, adding other frequencies, 80% make trips with some regularity, similar figures to those of the Araucanía Region for Temuco. The reasons for these journeys are mainly access to goods and services, as well as pendular movements for work or university studies, although the category of "other" reasons also appears. In terms of travel time, location and infrastructure have a significant influence, since 60.6% of trips exceed one hour, including 40.5% that last between one and one and a half hours or more, as well as trips of two hours or more.

Regarding the means of transport and frequency, only the latter varies in Valdivia, where there is a better perception: 71% declare it optimal for round trips. The cost is lower than in Temuco. In fact, the inhabitants of the Los Ríos Region would rather spend a significant part of their expenses in their cities and, in the capital, Valdivia, only about 35%.

Figures 2 and 3 show, in general terms, the dynamics of population movements to access goods and services, but when analyzing the relationships between variables and the sample's behavior, other processes emerge. Figures 4, 5, and 6, the result of the ACM supplemented with the crossing of variables, reveal that the first two dimensions explain about 8% and 6% of the variance (14% in total), low values that reflect the complexity of establishing clear relationships given the nature of the variables surveyed. However, Figure 4 provides relevant information on the similarities and differences between response categories and variables as perceived by individuals.

In particular, for Araucanía, the first two dimensions explain 14.27% of the total variability in the data (Dimension 1: 8.17%; Dimension 2: 6.10%). The first dimension is strongly structured by variables associated with the intensity (Times per week) and reason for the trips to Temuco. In particular, the reason for the trip has the greatest association with this dimension ($R^2 = 0.77$; $p < 0.001$), times per week ($R^2 = 0.66$), the work or occupation of the respondents (a) ($R^2 = 0.52$), and the city of residence ($R^2 = 0.42$). Travel time ($R^2 = 0.38$), age ($R^2 = 0.32$), and educational level ($R^2 = 0.30$) also contribute. The categories that characterize the positive end of the axis are mainly for individuals who travel to Temuco for study purposes, travel more than 4 times a week, are aged 18 to 25, have incomplete technical or university education, and travel for 30 minutes to 1 hour. In contrast, the negative end of the axis is associated with occasional trips, trips motivated by health or errands, longer travel times (more than two hours), and older age groups.

On the other hand, the second dimension mainly concerns accessibility conditions and the means of transport used to reach Temuco. In this axis, the frequency of the bus ($R^2 = 0.60$) and the means of transport ($R^2 = 0.53$) stand out as the variables with the greatest explanatory capacity, followed by the level of education ($R^2 = 0.25$), the reason for the trip ($R^2 = 0.27$), and the services accessed in the city ($R^2 = 0.44$). The positive end of the axis is characterized by personal transportation, employment, and trips occurring approximately once a week, as well as vocational or university education levels. In contrast, the negative extreme is associated with the use of public transport, occasional trips, lower educational levels (incomplete primary or secondary education), lower transport spending, and trips motivated by health reasons. Altogether, these dimensions indicate that trips to Temuco in the region are structured mainly by the frequency and purpose of the trip, as well as by differences in means of transport and access conditions to the city.

In the case of the Los Ríos region, trips to Valdivia are mainly organized by purpose and frequency. The first

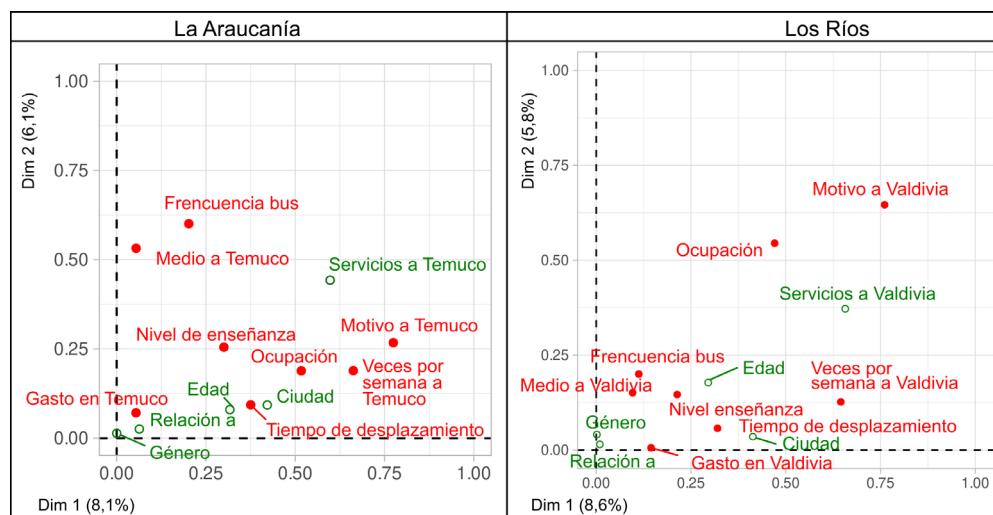


Figure 4. Representation of variables in the factorial planes. Source: Prepared by the authors.

dimension is strongly associated with the reason for the trip ($R^2 = 0.76$; $p < 0.001$), the weekly frequency of trips ($R^2 = 0.65$), access to services ($R^2 = 0.66$), and respondents' jobs or occupations ($R^2 = 0.47$). The city of residence ($R^2 = 0.41$), travel time ($R^2 = 0.32$), age ($R^2 = 0.30$), and educational level ($R^2 = 0.21$) also have relevant associations. The positive end of the axis is mainly characterized by occasional trips to Valdivia, associated with health reasons or errands for older people (51 years or older), with incomplete primary or secondary education, longer travel times (more than two hours), and lower transportation spending. These profiles are concentrated in more peripheral communes of the region, such as Panguipulli, Lago Ranco, and Futrono. In contrast, the negative end of the dimension is associated with frequent trips (more than four times a week), made mainly by young students (18-25 years old) with vocational education or university studies who move to Valdivia for study purposes and have shorter travel times.

On the other hand, the second dimension is mainly associated with the occupational situation and the work reasons for the journeys. In this axis, jobs (occupation) ($R^2 = 0.54$) and the reason for the trip ($R^2 = 0.65$) stand out as the most influential variables, followed by the frequency of the bus ($R^2 = 0.20$), age ($R^2 = 0.18$), the means of transport used ($R^2 = 0.15$), and educational level ($R^2 = 0.15$). The positive end of the axis is characterized by individuals who work and travel to Valdivia for work, usually two to three times a week, use personal transportation, and belong to intermediate age groups (26-50 years) with vocational or university education levels. In contrast, the negative extreme is associated with trips related to study or health, people who are retired or engaged in domestic work, the

elderly population, and the predominant use of collective transport. Altogether, these dimensions suggest that the trips to Valdivia are structured around two main dynamics: on the one hand, occasional trips associated with specific needs from more distant communes (or cities), and, on the other, more frequent trips linked to educational and work activities.

In comparative terms, the results of multiple correspondence analyses express similar patterns, but with some nuances. In both La Araucanía and Los Ríos, the first dimension is strongly shaped by the purpose of the trip and the frequency of trips to the regional capital, underscoring the central role of these cities as service hubs in their respective regions. However, while in La Araucanía the main dimension is associated more with frequent trips linked to educational activities, particularly among young people who travel several times a week, in Los Ríos the axis structure distinguishes more clearly between occasional trips associated with specific needs such as health or errands from peripheral communes and more regular trips. Also, in the second dimension, it is observed that in Los Ríos, work trips and occupational status carry greater weight in differentiating mobility patterns. In contrast, in Araucanía, differences in modes of transport and accessibility conditions are more relevant.

For their part, Figures 5 and 6 show, for each region, the survey questions and each individual's answers by category, plotted on a plane as a cloud of points, with each point corresponding to a respondent.

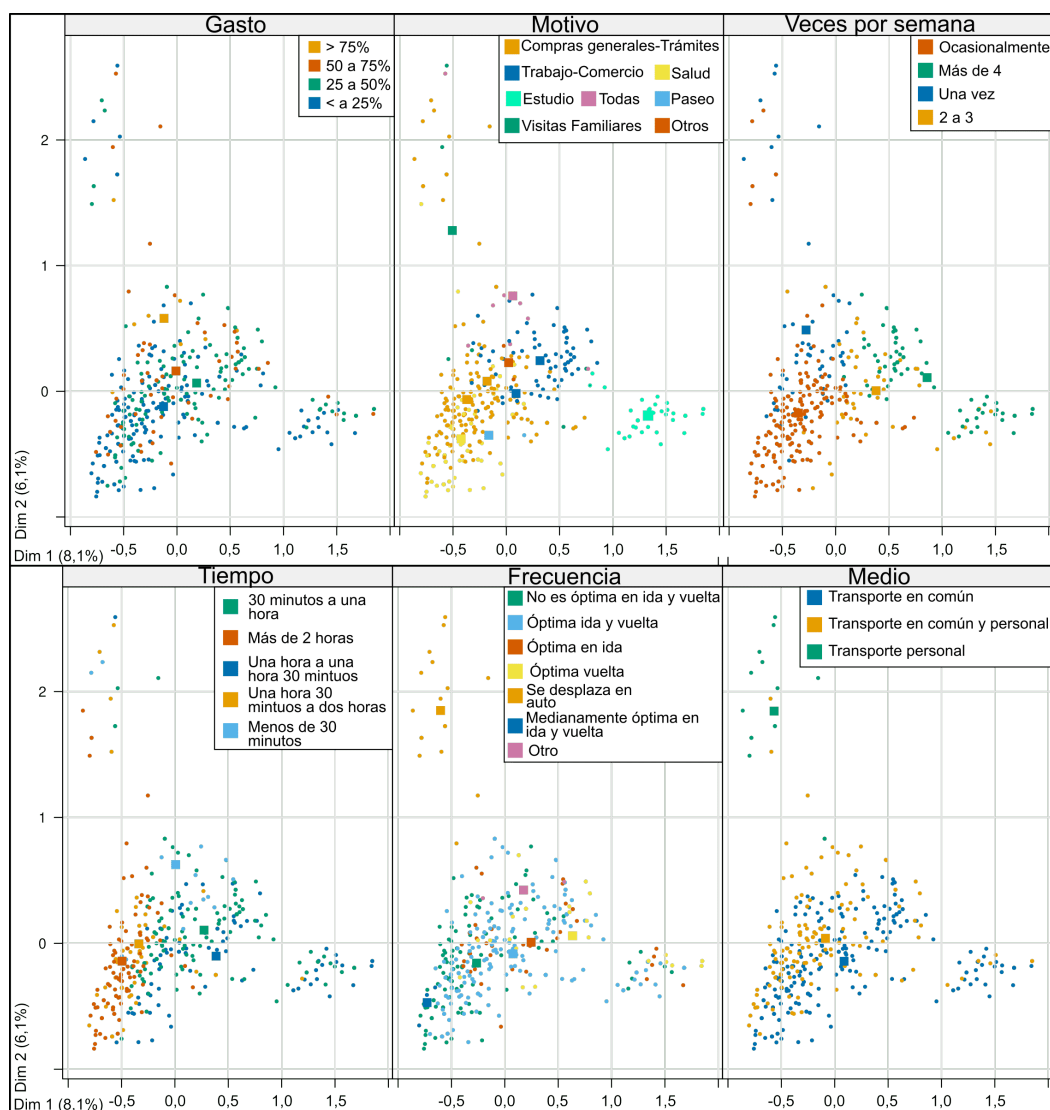


Figure 5. Confidence ellipses of the ACM results for the questions in the Araucanía Region regarding Temuco. Source: Prepared by the authors.

The results show that the points representing each individual are close when their responses to certain modalities or categories are similar, and the colored quadrants around indicate averages of related responses. In Figure 5, for the Region of La Araucanía, it is observed that groups of individuals with similar characteristics, such as those who spend less than 25% in Temuco, tend to prefer to run errands, make general purchases, or take occasional trips. An outstanding finding is that those who travel for study reasons are those who travel more often (more than four times a week), while those who travel for work show more

dispersed patterns, with trips varying between one and more than four times a week, which suggests a non-permanent work logic and raises reflections on modalities such as teleworking.

Figure 5 shows that general purchases, errands, or health reasons are associated with longer travel times, including occasional trips lasting between an hour and a half and more than two hours, indicating that the population is willing to travel for extended periods regardless of the service. Regarding the means of

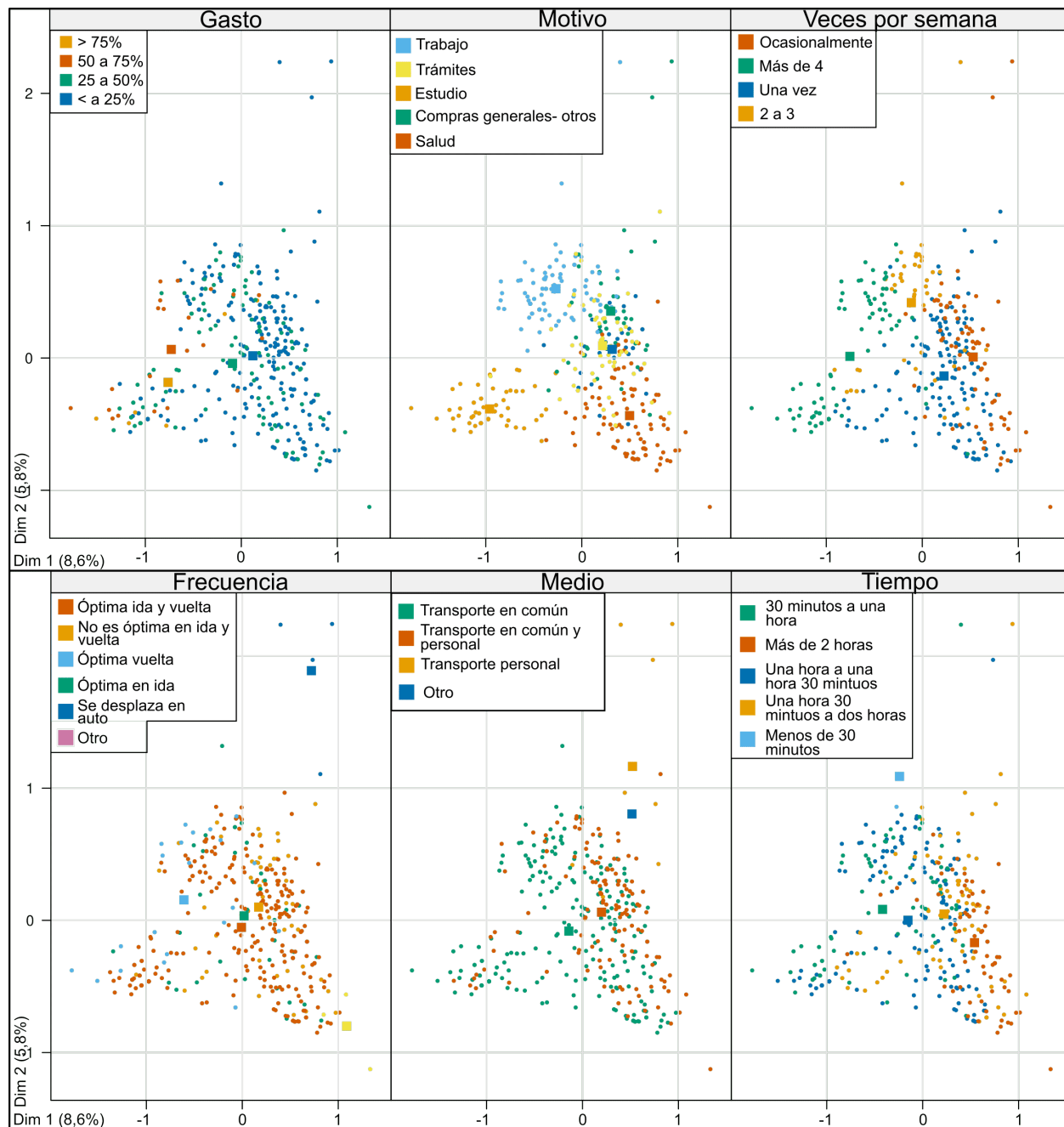


Figure 6. Confidence ellipses of the ACM results for the questions in the Los Ríos Region regarding Valdivia. Source: Prepared by the authors.

transport and frequency, no clear patterns are observed: those who travel for study tend to use public transport, whereas those who travel by car tend to travel less frequently, mainly for purchases or errands. In Valdivia, according to Figure 6, some outliers outside the main group are identified, though fewer than in La Araucanía, with no more than 5 cases.

The answers regarding the reason for the displacement, weekly frequency, and time show great heterogeneity across modalities. Similar to La Araucanía, in Los Ríos, 67% of those who study travel more than four times a week, while for work, this percentage is lower at 54%. In addition, those who travel for health reasons tend to do so less frequently: 61% travel once a week, and 31% occasionally. A smaller percentage of students alternate between public and private transport, a trend also observed in La Araucanía. Finally, it is highlighted that those who make longer trips tend to spend less, since 26% of individuals who travel at least an hour and a half allocate only 25% of their income to these trips, similar to the 25% who travel between one and one and a half hours.

V. DISCUSSION

Regarding the results, several aspects warrant discussion. The first is the sampling applied, particularly the number of surveys. Although the cluster method limits the analysis to an aggregate regional capital level and does not allow specific conclusions for each city, its application with limited resources has proven effective. It has been validated in previous studies (Bustamante, Cortés & Maturana, 2023). Therefore, the results obtained can be considered reliable and consistent with the methodological design, as they reflect general trends in displacement across both regions. The results also provide a valid basis for comparative analysis (between regions and their regional capitals) and for formulating aggregate-level interpretations.

Another aspect to be discussed is the logic behind the journey for the populations of smaller cities in the La Araucanía and Los Ríos regions, which follows a center-periphery pattern that reflects the polarization and regional concentration already documented (Maturana Miranda & Vial Cossani, 2011; Maturana Miranda & Arenas Vásquez, 2012; Riquelme-Brevis et al., 2019). Valdivia and Temuco have established themselves as metropolises that function as hubs of floating population by intensifying movements for work, study, health, and consumption, in line with processes observed in other Latin American cities that surpass the category of intermediate cities (Icazuriaga Montes & Osorio Franco, 2014).

These dynamics are practices similar to those of large metropolitan areas and their peripheries (Jirón & Mansilla, 2013), emphasizing the importance of urban size in development processes (Pumain et al., 2006; Zhao et al., 2024). The lengthy travel times and high costs also indicate that distance friction is less relevant to everyday travel needs (Pumain & Saint-Julien, 2014). Although lengthy times are expected in intercommunal journeys, it is notable that for activities such as general shopping or health, some cases have recurrence and high times, which contravene the standards of the National Urban Development Policy and the National System of Indicators and Territorial Standards, SIET Chile. This situation coincides with observations in OECD countries, where rural areas tend to have longer travel times (Mseke, Jessup & Barnett, 2024).

On the other hand, another little-discussed aspect concerns the profile of those who travel for work reasons. For example, it has been found that, in Norte Chico, the reasons for traveling are very different from those in the south; these, for the former, are based on employment and gender, while, for the latter, they are due to salary, gender, quintile, and type of coexistence. In addition, sales would be another reason to travel for work. Hence, a city that sells more products or services in a base year attracts people to work there the following year. The interesting thing about this aspect is that smaller localities that offer high salaries achieve an inverse effect: they attract people and do not send them to larger centers (Soza-Amigo et al., 2023).

In this line, in light of the results obtained, it is evident that mobility for work or study purposes is the most relevant; however, travel associated with services or health also holds high importance, yet it is relatively less visible. In this sense, several studies in Latin America (Hernández & Rossel, 2015; Marinho, Dahuabe & Arenas de Mesa, 2023) have begun to show the relevance of these mobility patterns, highlighting their impact on access to opportunities and the quality of life of the population.

This study presents the limitation of not considering the train as a means of transport in Temuco. Despite the positive evaluation of the Victoria-Temuco section (Riquelme Brevis et al., 2020), Valdivia does not offer this service. Commuting for work could become less frequent, inviting reflection on the growing impact of teleworking, accelerated by the pandemic (Ossa Cornejo et al., 2024). Although the sample may seem limited in terms of the number of cities, the surveys used proved very useful for understanding the dynamics of intra- and inter-urban mobility in Chile (Arevalo-Molina, Pérez-Bustamante & Villouta-Gutiérrez, 2023; Lazo et al., 2023).

Given that there have been no origin-destination surveys for intercommunal movements since 2002 (population census), beyond the release of data associated with the 2024 Census, future studies could provide relevant evidence in this area and contribute to updating the available knowledge. In this context, other surveys such as the ESI or CASEN have limitations for this type of analysis because they use different approaches in both the design of their questionnaires and the observation scales used in this research.

On the other hand, alternative methods such as the use of mobile phone data, although they have been applied in Chile and in other countries (Samaniego et al., 2020; Hadachi, Pourmoradnasseri & Khoshkhal, 2020; Louail et al., 2014; Zhuo et al., 2022), face significant restrictions associated with their coverage, updating and access, mainly due to current regulations on privacy and data use.

In this scenario, the limitations of the available information reinforce the relevance of the methodological approach adopted in this study and of its results, which provide empirical evidence in an area where data are scarce and difficult to access.

Finally, the new Regional Territorial Planning Plans [PROT], within the framework of Law 21.074 and its associated national policy, represent an opportunity to comprehensively analyze territorial connectivity and centrality by improving relations between regional settlements (Peña-Cortés et al., 2022). This is of utmost importance since the regulation of such instruments was approved in March 2026.

VI. CONCLUSIONS

Intercommunal displacements have been consolidated as a substantive process in the structuring and reconfiguration of interconnections that connect the network of cities. These territorial flows respond, to a large extent, to the population's need to access goods, services, and opportunities that are not available or are offered only in limited supply in their places of residence. Thus, the movements between cities, or pendular movements within their respective communes, not only constitute a recurrent socio-territorial practice but also serve as a structural component in the functional organization of the urban-regional system.

In this sense, the article's findings allow for the identification of at least three relevant processes. The first one shows that, despite increasing digital and technological advances that could reduce the need for physical journeys for certain services, the motivations associated with employment,

health, and education remain central and highly explanatory factors for most trips. This suggests that, although digitalization has transformed certain social and economic dynamics, it has not significantly replaced the need to travel in structural areas.

A second process, closely tied to the previous one, is largely explained by the strong concentration of employment and the diversity of the commercial and service offer in the regional capitals. This concentration reinforces the predominant role of these cities, in this case, Temuco and Valdivia, as articulating nodes for their respective regional systems. Both capitals polarize broad spheres of influence at the regional scale, configuring a highly centralized pattern of flows. This spatial model of displacement is maintained beyond the specific geographical location of these capitals, one located in a greater regional centrality and the other in a coastal location, which shows that functional centrality exceeds merely morphological or localization conditions. A third element refers to the need to problematize and question the development model implemented in smaller cities. The persistence and magnitude of these intercommunal journeys raise questions regarding the capacity of these cities to diversify their economic base and strengthen their service offer. From a spatial and public policy perspective, it is essential to reflect on how to articulate the interaction network among urban centers in a more balanced way to promote greater territorial complementarity and reduce the functional asymmetries that currently structure flows.

In this context, the accessibility dimensions discussed in the text referring to the service offer's location, the available transport infrastructure, the temporality of the journeys, and the strategies used by the inhabitants themselves to materialize them constitute key elements for the comprehensive understanding of the phenomenon. These factors have been considered in a structured manner in the design and implementation of public policies, such as the National Territorial Planning Policy and its rollout into Urban and Rural Policies. However, progress must be made not only to ensure access itself through displacement, but also to evaluate the appropriate conditions for comfort, equity, and quality in access.

Finally, and in line with this, these elements acquire special relevance within the framework of the objectives set by the National Territorial Planning Policy, whose guidelines are translated into specific strategies systematized in the recently updated Regional Development Strategies (RDS) of the analyzed regions. Consequently, understanding the spatial logic of intercommunal flows not only allows us to describe current territorial dynamics but also to provide substantive input for formulating policies aimed at more balanced, integrated, and sustainable territorial development, with a focus on access conditions.

VII. CONTRIBUTION OF AUTHORS CRedit:

Conceptualization, F.M., F.P.C., S.S.A.; Data Curation, J.C.; Formal analysis, F.M., S.S.A.; Acquisition of financing, F.M., F.P.C.; Research, F.M., F.P.C.; Methodology, F.M.; Project management, F.M., F.P.C.; Resources, F.M., F.P.C.; Software, F.M., F.P.C.; Supervision, F.M., F.P.C., S.S.A.; Validation, F.M., F.P.C., S.S.A.; Visualization, F.M., F.P.C.; Writing – original draft, F.M., J.C., S.S.A.; Writing – revision and editing, F.M., F.P.C., J.C., S.S.A.

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X. APPENDIX

Questions of the applied questionnaire

1. What age range are you in?

- 18-25
- 26-35
- 36-50
- 51-65
- 65+

2. What is your level of education?

- Primary or Incomplete Secondary
- Complete Secondary
- Incomplete technical or university studies
- Technical
- University

3. What do you currently do for a living?

- Work
- Study
- Looking for a job
- Homeowner
- Retired
- Others

4. How many times a week do you travel to Temuco/Valdivia?

- Once a week
- Between 2 and 3 times a week
- More than 4 times a week
- Once a month or very occasionally

5. What is the reason for your trip?

- Work
- Study
- Errands
- Health
- General purchases
- All

6. How long does it (usually) take to get to your final destination?

- < 30 minutes
- Between 30 minutes and an hour
- Between an hour and an hour and a half
- An hour and a half and 2 hours
- More than 2 hours

7. How do you travel to Temuco/Valdivia (at least once by personal vehicle, then mark 2)

- Only by shared transport (buses)
- By shared transportation and personal vehicle
- Personal vehicle

8. As for your trips by shared transport (buses)

- The frequency is optimal for both the outbound journey and the return
- Only the outbound
- Only the return
- The frequency is not optimal in any case

9. Approximately how much (%) of your total expenses excluding housing do you spend in Temuco?

- < 25%
- Between 25% and 50%
- 50% to 75%
- 75%

10. According to the reality of your city, what services must you usually go to Temuco/Valdivia to access? (There can be several options)

- Health (establishment, pharmacies, dentistry, medical consultations, examinations)
- Recreation in general (trips out to eat, etc.)
- Food shopping in general
- Purchase of clothing, appliances, materials, and others
- Errands associated with the State, local authorities, Fonasa (public health), civil registry, etc.
- Banking or financial errands
- Education
- Errands/purchases associated with logistics transport, telephones, mail, and connectivity in general

